Return to

To: Chancellor Stratton
Dean Harrison

From: S. E. Luria

MIT

COMMENT ON THE CONFERENCE OF DECEMBER 18, 1956

The situation as presented to us at the meeting seems to raise three types of problems: (1) goals and direction; (2) personnel; and (3) leadership. I feel the first problem holds the key to the solution of the others.

1. Goals and direction. The accepted goal of the Biology Department at M.I.T. is to train biologists who are interested in the fundamental aspects of Biology, especially in the relation of function to structure in the organic world, and who bring to this task the advantage of a superior training in mathematics and the physical sciences. The implementation of this goal depends on a correct evaluation of Biology and its subdivisions.

I suggest that the relevant areas of Biology be visualized as follows:

(a) The descriptive area of main life processes, especially cellular phenomena (general biology; cell physiology; microbiology).

(b) The area of unit processes at the chemical level (biochemistry; physico-chemical biology).

(c) The area of control systems (genetics; physiological genetics; information in macromolecules).

(d) The area of integrated systems (cytochemistry; transfer of information; group biology).

The teaching of Biology, thus visualized, can be done at both undergraduate and graduate levels.

Undergraduates. I feel that M.I.T. should not concentrate on those biology undergraduates aiming at a terminal B.S. degree, but only on potential graduate students and possibly premedical students. The latter group could probably take at Harvard some of the courses specifically required for admission to medical schools.

Graduates. The offerings in biology should be such that the student without any training in biology, but wishing to become a biologist, can acquire the background rapidly and without interminable "prerequisites".

With this in mind I would suggest the following types of courses:

1. A General Biology course (one year) (lecture and laboratory, with prerequisite of organic chemistry) offered at the junior year and acceptable for graduate credit. This course to include microbiology.

2. An Undergraduate Seminar, to accompany the General Biology course, to expose students to areas of research and of applied biology.

3. A Biochemistry course (one year) (lecture and laboratory) offered at the senior year and acceptable for graduate credit, including intermediary metabolism and elements of specialized physical chemistry (bioenergetics, steadystate systems).

4. A Genetics course (one semester) senior and graduate credit.

These four courses would constitute the required courses in biology for an undergraduate biology major.

5. Graduate courses (some open also to seniors as electives, and subject to change in emphasis depending on staff composition):

   (a) Microbial Physiology.

   (b) Microbial Genetics.

   (c) Macromolecular Structure; Cytochemistry; Biophysics.

   (d) Physiological Genetics. (Information and transfer of information in biology; development).

   (e) Group Biology. (Populations; biostatistics).

2. Personnel.. Two problems seem to require attention: the presence of some staff members that can contribute little to a program such as outlined above, and the need for more strong leaders in modern biology.

A possible solution to the first problem may be the creation of a section or laboratory of Bioinstrumentation, with staff and program of its own and outside the Biology Department.

A solution to the second problem will be found in the choice of people with the proper combination of competence in the areas listed above and of leadership as biologists.

3. Leadership. While personally unacquainted with Professor Sizer, I was impressed by the unanimity with which he was endorsed by those who knew him. His plan on Life Science at M.I.T. appeared sound, although possibly too tied to the past. Two elements should be considered in this connection: The Chairman should believe in whatever set of goals and program are adopted, and he should command the respect of the present staff and especially of the new additions to the faculty. In this respect, it may be desirable to withhold final decision as to a permanent chairman until after some exploration of prospective new faculty members and of some discussion of possible changes in offerings and perspectives.